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SECONDARY METHODS OF EXTRACTION
INCREASE USSR PETROLEUM OUTPUT

ARTIFICIAL PRESSURE ADVOCATED IN AZERBAIDZHAN FIELDS -- Baku, Bakinskiy Rabochiy,
 3 Mar 51

The following presents the major points of an article by Professor G. N. Gaziyeu, active member, Academy of Sciences Azerbaydihan SSR, on the importance of secondary methods of extraction for the Azerbaydihan petroleum industry.

Secondary methods of extraction are one of the chief means by which the Azerbaydihan petroleum industry may step up its petroleum output. The injection of gas or water into the stratum assures the maximum recovery of unextracted petroleum and also assures improvement in the exploitation coefficient of new petroleum horizons. Use of such methods in new deposits considerably decreases the required drilling time as well as capital construction and consumption of materials. In the case of old deposits which have been subjected to long exploitation, the adoption of secondary methods permits the extraction of a considerable amount of additional petroleum which had remained in the strata. The daily output of petroleum from oil wells of the Azneft' Association, which used secondary methods, increased 21.6 percent but, in spite of this, only 5 percent of producing wells of the Azneft' Association are being exploited by these methods. If secondary methods were employed on a wider scale, a sharp increase in the petroleum output would follow.

Managers of most petroleum trusts continue to underestimate the importance of secondary methods in petroleum extraction. In many cases, gas or water is injected into a stratum when there has been inadequate preliminary work, such as selecting samples to study the physical properties of the oil-bearing sands and petroleum, determining stratum pressure and temperature, and improving the functioning of the input wells. In enterprises of the Kirovneft', Buzovnyneft', and Molotovneft' trusts, artificially induced pressure has been far less than provided for in the plan.

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A water filtering installation is a necessity in connection with the use of water to restore or increase stratum pressure. Work is in progress on such an installation at oil field No 5 of the Leninneft' Trust, and the Azneftezavodstroy is enlarging the filtering installation of the Buzovnyneft' Trust, but in both instances the work is proceeding slowly. The Buzovnyneft' Trust's installation has not been functioning properly and as a result the water pumped into the input wells contains mechanical admixtures beyond the established norm. For this reason input wells are quickly clogged up and their absorption coefficient soon drops. Strict measures must be adopted to improve water filtering.

The Baku oil trusts must also find additional water reserves to be used in secondary methods of petroleum extraction. Experimental data on petroleum extraction from the AzNII indicate that alkaline waters are best, but the supply of alkaline waters is limited and is not available to all trusts. Water required for contour flooding of the Podkirmakinskiy series in the oil fields of the Buzovnyneft' Trust is collected in the Azizbekovneft' Trust and conveyed at great expense to Buzovny. According to data of the Vodgeo (All-Union Scientific Research Institute of Water Supply, Sewerage, Hydraulic Engineering Equipment, and Engineering Geology) sea water, in its natural state or after slight processing, may be used for contour flooding. A speedy and final decision on the question is important since the Baku oil fields have inexhaustible supplies of sea water at their disposal.

To study the physical qualities of the oil-bearing sands it is very important to obtain samples of the rock by drilling exploratory wells. Core bits now being used do not take out more than 20 percent of rock types. AZINMASH must revise the design of core bits and design new ones to assure careful removal of samples of all types of rock to be drilled.

According to the decision of the Council of Ministers USSR, a petroleum expedition has been organized under the Academy of Sciences Azerbaydzhan SSR, whose goal is to work out measures to increase the petroleum output of the Azerbaydzhan deposits by improving exploitation and by introducing methods of artificial pressure on the strata.

The petroleum expedition has already gone to work. It has the services of scholars and workers of the petroleum industry of the republic and has established close contacts with Moscow scientific workers. The expedition has begun to work out technological schemes for exerting pressure on petroleum deposits. Such plans are almost completed for the Podkirmakinskiy series in the Leninneft' and Kirovneft' trusts.

All this indicates the great interest in the question of the industrial introduction of artificially induced pressure into petroleum strata to extract the maximum amount from the deposit.

At present Soviet plants are preparing an adequate number of control and measuring instruments for petroleum extraction and oil-well drilling. The Aztekh-slabneft' Trust must supply all oil fields with these instruments and managers must take steps for their receipt and mastery.

BASHKIRIA INCREASES WATER USE IN FIELDS -- Eksploatatsiya neftyanykh mestorozhdeniy (Exploitation of Petroleum Deposits), I. M. Murav'yev and A. P. Krylov, Gostoptekhzdat, 1949

A most important project in contour flooding to maintain pressure is being carried out in the oil fields of the Tuymazaneft' Trust, Bashneft' Association, for Devonian petroleum deposits.

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The Devonian petroleum in Tuymazy occurs in two sandy D-I and D-II horizons which occupy an enormous area in the sloping brachyanticlinal structure, one directly under the other. The subject of the primary pressure-maintenance work is the D-II horizon which is at a depth of 1,680-1,700 meters, and where exploitation started at the end of 1944. The horizon does not have feed territory and is a vast closed reservoir of varying thickness, filled with oil at the center and water on the outside. Water pressure in the reservoir is not great and after 2½ years of exploitation the pressure at the level of water-petroleum contact dropped to such an extent that pressure-maintenance work had to be instigated if the rate established for extracting petroleum from the stratum were to be maintained or increased.

When the necessary construction work was being carried on in 1947, experiments were made in letting water automatically flow into the D-II horizon from the 1 ver D-IV horizon which has a higher reservoir pressure. This was done in four wells, and in two of them the D-II horizon consumed 150 to 350 cubic meters per day. The vast potentialities of the D-IV horizon and the somewhat lesser potentialities of the D-III horizon make it possible to rely on them for a certain reserve in supplying the deposit with pressure. In the middle of 1948, the forcing of water from the surface into four input wells was begun, 400 to 500 cubic meters being forced down each. For a driving agent water from the Ik River is used after being filtered.

Work is being done to increase the amount of water injected to 6,000-7,000 cubic meters per day and the number of input wells to between ten and 12 (for D-II), with further expansion of the work to the D-I horizon.

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